IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number:	10/804,688
Filing Date:	03/19/2004
Applicant(s):	Brent L. Davis, Peeyush Jaiswal, Alan P. McDonley Vanessa V. Michelini
Entitled:	SPEECH DISAMBIGUATION FOR STRING PROCESSING IN AN INTERACTIVE VOICE RESPONSE SYSTEM
Examiner:	Abul K. Azad
Group Art Unit:	2626
Attorney Docket No.:	BOC920030059US1 (1082-024U)

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed September 29, 2008. This Appeal Brief has been timely filed within the shortened statutory period of two months from the date of the filing of the Notice of Appeal, an extension of time under 37 C.F.R. § 1.136 is not required. Notwithstanding, please charge any shortage in fees due under 37 C.F.R. §§ 1.17, 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-3839, and please credit any excess fees to such deposit account.

Date: December 1, 2008

Respectfully submitted,

/Steven M. Greenberg/
Steven M. Greenberg, Registration No. 44,725
Customer Number 46322

PATENT

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APPEAL BRIEF

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Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed September 29, 2008, wherein Appellants appeal from the Examiner's rejection of claims 1 through 19.

I. REAL PARTY IN INTEREST

This application is assigned to International Business Machines Corporation by assignment recorded on March 19, 2004, at Reel 015122, Frame 0750.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1 through 19 are pending in this Application and have been three times rejected. It is from the multiple rejections of claims 1 through 19 that this Appeal is taken.

IV. STATUS OF AMENDMENTS

The claims have not been amended subsequent to the imposition of the Final Office Action re-opening prosecution dated June 27, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 9 and 12 are respectively directed to a method for processing string input for a field in an interactive voice response (IVR) system, an IVR system, and a machine readable storage having stored thereon a computer program for processing string input for a field in an IVR system. In Appellants' invention as described specifically in Par. [0015] and [0016] of Appellants' published specification, one or more fields within an interface managed by the IVR system can be processed to identify a subset of input for the field which enjoys a higher likelihood of pattern recognition. Specifically, the string can be inspected to identify a subset consisting of numbers, letters or both which enjoys a higher likelihood of accurate speech recognition than other numeric characters, alphabetic characters, and alphanumeric characters in the string. Similarly, the string can be inspected to identify a pattern of numeric characters, alphabetic characters, and alphanumeric characters which are more likely to be uniquely identified among a database of strings than other numeric characters, alphabetic characters, and alphanumeric characters.

Once a subset has been identified for the strings associated with the field, interacting users can be prompted to complete the field not by specification of the entire string associated with the field, but with a mere subset of the string associated with the field. As the subset will have been chosen to enhance both the likelihood of speech recognition and unique identification, the IVR system can more efficiently match the provided input to existing data for the field without requiring the use of exhaustive levels of prompting for complete string input. In this regard, the provided user input can be disambiguated from other possible matching data without subjecting the user to unnecessary prompts.

With respect specifically to claim 1, a method for processing string input for a field in an IVR system includes identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition. (Par. [0025]) Specifically, the sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0025]) The method also includes prompting an interacting user for string input limited to the sub-string pattern. (Par. [0026]) Yet further, the method includes matching received sub-string input conforming to the sub-string pattern with data which conforms to the acceptable input to locate the string input for the field. (Par. [0026]) Finally, the method includes completing the field with the matched data. (Par. [0026]).

With respect specifically to claim 9, an IVR system includes at least one form including at least one field which can be completed using input received through the IVR system. (Figure 1, Element 160) The system also includes a sub-string analyzer coupled to the IVR system.

(Figure 1, Element 190) Finally, the system includes a search processor (Figure 1, Element 180) coupled both to the IVR system and a database of data configured for searching based upon sub-strings which match sub-string patterns produced by said sub-string analyzer. (Figure 1, Element 170) In this regard, the sub-string patterns exclusively contain a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0019]) Consequently, the field is completed using data matched in the database with the search processor using sub-string input provided through the IVR system. (Par. [0023])

Finally, with respect specifically to claim 12, a machine readable storage can be provided to have stored thereon a computer program for processing string input for a field in an IVR system. The computer program includes a routine set of instructions which when executed by a machine cause the machine to identify a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition. (Par. [0025]) Specifically, the sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0025]) The routine set of instructions when executed by the machine also cause the machine to prompt an interacting user for string input limited to the sub-string pattern. (Par. [0026]) Yet further, the routine set of instructions when executed by the machine cause the machine to match received sub-string input conforming to the sub-string pattern with data conforms to the acceptable input to locate the string input for the field. (Par. [0026]) Finally, the routine set of instructions when executed by the machine cause the machine to complete the field with the matched data. (Par. [0026])

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-19 are not anticipated by United States Patent No. 5,454,063 to Rossides et al. (Rossides).

VII. THE ARGUMENT

THE REJECTION OF CLAIMS 1 THROUGH 19 UNDER 35 U.S.C. § 102(B) AS BEING ANTICIPATED BY ROSSIDES.

For convenience of the Honorable Board in addressing the rejections, claims 2 through 8 stand or fall together with independent claim 1, claims 10 through 11 stand or fall together with independent claim 9, and claims 13 through 19 stand or fall together with independent claim 12.

In the Final Office Action, Examiner issued a new grounds of rejection of claims 1 through 19 based upon the Rossides reference[1]. Exemplary claim 1 as previously amended reads as follows:

> 1. A method for processing string input for a field in an interactive voice response (IVR) system, the method comprising the steps of:
>
> identifying a sub-string pattern of characters within acceptable input for the field **which is known to enjoy a high likelihood of recognition**, the sub-string pattern of characters exclusively containing **a sequence of characters appearing amongst all characters for the acceptable input for the field**;
>
> prompting an interacting user for string input limited to said sub-string pattern;
>
> matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,
>
> completing the field with said matched data.

[1] It strikes Appellants odd that Examiner would re-open prosecution with the issuance of a "Final" Office Action. In particular, M.P.E.P. 1207.04 provides, "The examiner may, with approval from the supervisory patent examiner, reopen prosecution to enter a new ground of rejection after appellant's brief or reply brief has been filed. The Office action containing a new ground of rejection may be made final if the new ground of rejection was (A) necessitated by amendment, or (B) based on information presented in an information disclosure statement under 37 CFR 1.97(c) where no statement under 37 CFR 1.97(e) was filed." In the instant case, Appellants had provided no amendment necessitating the new ground of rejection and the Rossides reference to the knowledge of Appellants was not presented in an IDS under 37 CFR 1.97(c).

Elemental to Claim 1 as originally presented, is the identification of a sub-string pattern of characters within acceptable input for a field which is known to enjoy a high likelihood of recognition. Further, integral to amended claim 1 is the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field.

Rossides fails to provide either of these teachings. The factual determination of anticipation under 35 U.S.C. § 102 requires the identical disclosure, either explicitly or inherently, of each element of a claimed invention in a single reference.[2] Moreover, the anticipating prior art reference must describe the recited invention with sufficient clarity and detail to establish that the claimed limitations existed in the prior art and that such existence would be recognized by one having ordinary skill in the art.[3] Absence from an allegedly anticipating prior art reference of any claimed element negates anticipation.[4]

The Examiner relies exclusively upon column 1, line 26 to 42 and column 1, line 56 to 63 of Rossides in support of Examiner's argument that Rossides teaches the identification of a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field. The entirety

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[2] In re Schreiber, 128 F.3d 1473, 1477 (Fed. Cir. 1997) ("To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently"), In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed. Cir. 1984).

[3] See In re Spada, 911 F.2d 705, 708, 15 USPQ 1655, 1657 (Fed. Cir. 1990); Diversitech Corp. v. Century Steps Inc., 850 F.2d 675, 678, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988).

[4] Kloster Speedsteel AB v. Crucible, Inc., 793 F.2d 1565, 1571 (Fed. Cir. 1986)(emphasis added).

of the cited portion of Rossides is reproduced herein for the convenience of the Honorable Board:

> A solution would seem to be spelling so that the names themselves would not actually be recognized, just the letters in the names. The problem here is that recognizers have trouble with letters. (Letters are hard to distinguish even for humans.) Even if a recognizer is 90% accurate, it would still have [over a 50%] approximately a 47% chance of making a mistake with just 6 letters spelled. It is easy to see then why recognizers have not been used to automate of such tasks as directory assistance, where callers would spell names into a computer.
>
> One way around this problem is to make the recognizer interactive. Thus when a speaker says, for example, the letter "A", the recognizer would output its best guess. The recognizer might return an audio message, "Did you say `K`?" The speaker would reply, "NO," and the recognizer would then output its next best guess, perhaps "J" or perhaps "A". Eventually, the recognizer would get the letter right.
>
> Given that alpha recognizers have limited ability to recognize letters quickly, a fruitful approach to spelling names is to abbreviate the names. With a good abbreviation method [("data compression algorithm")], a small number of letters can stand for an entire name. A practical abbreviation method must combine great user friendliness and efficient compression. The basics of such a method, and the system for implementing it, are as follows:

It will be plain to the Honorable Board that the cited portion of Rossides relates only to the concept of abbreviating a name so as to shorten the number of letter-by-letter recognitions required when SPELLING a name to a recognizer. As such, Rossides wholly lacks a teaching directed to the identification of a sub-string pattern of characters within acceptable input for a field <u>which is known to enjoy a high likelihood of recognition</u>.

Further, Examiner refers to column 5, lines 4 through 64 (without any further detail) in support of the aforementioned comparison of the first limitation of claim 1 and Rossides. Again, for the convenience of the Honorable Board, the entirety of this MASSIVE SWATH of text is reproduced herein in its entirety:

> Last Word
>
> Another word identifier that denotes that the next letters entered correspond to the last word in a name.
>
> Positional Letter Identifier
>
> Input that denotes the sequential position in a word of the next letter entered. For example, "Fourth

letter," would denote that the next letter entered was the fourth letter in the word being spelled.

Last Letter

Input that denotes that the next letter entered is the last letter of the word being spelled.

Second-to-Last Letter

Input that denotes that the next letter entered is the second-to-last letter of the word being spelled.

Skip Letter

Input that denotes that the speaker is skipping a letter in a word. For example, if the word is "Bill" and the speaker enters "B," "Skip Letter," "L," "L," the abbreviation would be "B.sub.-- LL."

Skip Vowel

Input that denotes that the speaker is skipping a letter in a word and that the letter is a vowel. For example, if the word is "Bill" and the speaker enters "B," "Skip Vowel," "L," "L," the abbreviation would be "B vowel LL."

Skip Consonant

Input that denotes that the speaker is skipping a letter in a word and that the letter is a consonant. For example, if the word is "Bill" and the speaker enters "B," "I," "Skip Consonant," ["L,"] "L," the abbreviation would be "BI consonant [L]L."

Number of Letters in Word

Input that denotes how many letters are in the word being spelled. Or, input that denotes that the next input will denote how many letters are in the word being spelled.

Number of Letters in Name

Input that denotes how many letters are in the name being spelled. Or, input that denotes that the next input will denote how many letters are in the name being spelled.

Number of Words in Name

Input that denotes how many words are in the name being spelled. Or, input that denotes that the next input will denote how many words are in the name being spelled.

Word Done

Input that denotes that all the letters in a word have been spelled.

Words Done

Input that denotes that all the words in a name have been spelled to some extent.

Syllable Identifier

Input that denotes what syllable in a word a speaker's letter inputs correspond to. This identifier can work analogously to the word identifier. (However, this input is only noted. For simplicity's sake, it will not be discussed further.)

> Name Identifier
>
> Input that denotes what name a speaker's letter inputs correspond to. For example, "Second Name", denotes that the next letters entered are spelling the second name in a compound name. Unlike a word identifier, a name identifier would not necessarily denote sequential position. A name identifier could be descriptive, for instance, "Manufacturer", "Author", "Street", and so on.

While the Examiner has not specifically pinpointed where within the cited portion reproduced above such a teaching is believed to have been found, a line by line review of the cited portion reveals no such teaching. Further, the cited portion does not teach the identification of a sub-string pattern of characters where the sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field.

As noted by the Supreme Court in Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,[5] a clear and complete prosecution file record is important in that "[p]rosecution history estoppel requires that the claims of a patent be interpreted in light of the proceedings in the PTO during the application process." The Courts that are in a position to review the rejections set forth by the Examiner (i.e., the Board of Patent Appeals and Interferences, the Federal Circuit, and the Supreme Court) can only review what has been written in the record; and therefore, the Examiner must clearly set forth the rationale for the rejection and clearly and particularly point out those elements within the applied prior art being relied upon by the Examiner in the statement of the rejection.

Essentially, the Examiner is placing the burden on Appellants to establish that Rossides does not disclose the claimed elements based upon Appellants' interpretation of the claims and Appellants' comparison of the claims with the applied prior art. However, this shifting of burden, from the Examiner to Appellants, is premature since the Examiner has not discharged the

[5] 535 U.S. 722, 122 S.Ct. 1831, 1838, 62 USPQ2d 1705, 1710 (2002).

initial burden of providing a *prima facie* case of anticipation. Appellants also note that any continuing disagreement between Appellants and the Examiner as to whether or not a particular claimed feature is disclosed by Rossides is a direct result of a lack of specificity by the Examiner in the statement of the rejection.

To the extent the Examiner, having considered the foregoing arguments, persists and prepares an Examiner's Answer, Examiner is reminded of Examiner's responsibility under M.P.E.P. 1207.02(A)(1)(9)(e) to map every claim term in claim 1 to the Rossides reference. In this regard, for the convenience of the Examiner the entirety of is provided herein:

> For each rejection under 35 U.S.C. 102 or 103 where there are questions as to how limitations in the claims correspond to features in the prior art even after the examiner complies with the requirements of paragraphs (c) and (d) of this section, the examiner must compare at least one of the rejected claims **feature by feature** with the prior art relied on in the rejection. **The comparison must align the language of the claim side-by-side with a reference to the specific page, line number, drawing reference number, and quotation from the prior art, as appropriate.**

Specifically, Examiner must point out with particularity (and not entire columns of patent text) the precise teaching in Rossides that maps to the claimed element "identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field."

In view of the foregoing, Appellants respectfully submit that the Examiner's rejections under 35 U.S.C. § 102(b) based upon the applied prior art are not viable. Appellants, therefore, respectfully solicit the Honorable Board to reverse the Examiner's rejections under 35 U.S.C. § 102(b).

Date: December 1, 2008

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. (Previously Amended) A method for processing string input for a field in an interactive voice response (IVR) system, the method comprising the steps of:

identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

prompting an interacting user for string input limited to said sub-string pattern;

matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,

completing the field with said matched data.

2. (Original) The method of claim 1, wherein said identifying step comprises the step of identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy both a high likelihood of recognition and a high level of uniqueness.

3. (Original) The method of claim 1, wherein said identifying step comprises the step of identifying a sub-string pattern of numeric, alphabetic and alphanumeric characters within acceptable input for the field which is known to enjoy a high likelihood of recognition;

4. (Original) The method of claim 1, wherein said matching step comprises the step of querying a database for all records which have a specified field which contains said received sub-string input.

5. (Original) The method of claim 1, further comprising the step of pre-specifying which characters have a high likelihood of recognition.

6. (Original) The method of claim 1, further comprising the step of pre-specifying a likelihood of recognition value for each of said characters.

7. (Original) The method of claim 1, further comprising the step of, if said matching step produces a set of matching data, each data item in said set matching said sub-string input, disambiguating a desired data item from other data items in said set.

8. (Original) The method of claim 7, wherein said disambiguating step comprises the steps of:

selecting an additional field for processing,

additionally prompting said interacting user for additional input for said additional field;

matching received additional input for said additional prompting with data which conforms to said acceptable input to locate the string input for the field.

9. (Previously Amended) An interactive voice response (IVR) system comprising:

at least one form comprising at least one field which can be completed using input received through the IVR system;

a sub-string analyzer coupled to the IVR system; and,

a search processor coupled both to the IVR system and a database of data configured for searching based upon sub-strings which match sub-string patterns produced by said sub-string

analyzer, the sub-string patterns exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

wherein said at least one field is completed using data matched in said database with said search processor using sub-string input provided through the IVR system.

10. (Original) The system of claim 9, further comprising disambiguation logic.

11. (Original) The system of claim 9, wherein said sub-string analyzer comprises a pre-configuration of computed recognition likelihoods for individual characters for use in forming said sub-string patterns.

12. (Previously Amended) A machine readable storage having stored thereon a computer program for processing string input for a field in an interactive voice response (IVR) system, the computer program comprising a routine set of instructions which when executed by a machine cause the machine to perform the steps of:

identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

prompting an interacting user for string input limited to said sub-string pattern;

matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,

completing the field with said matched data.

13. (Original) The machine readable storage of claim 12, wherein said identifying step comprises the step of identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy both a high likelihood of recognition and a high level of uniqueness.

14. (Original) The machine readable storage of claim 12, wherein said identifying step comprises the step of identifying a sub-string pattern of numeric, alphabetic and alphanumeric characters within acceptable input for the field which is known to enjoy a high likelihood of recognition;

15. (Original) The machine readable storage of claim 12, wherein said matching step comprises the step of querying a database for all records which have a specified field which contains said received sub-string input.

16. (Original) The machine readable storage of claim 12, further comprising the step of pre-specifying which characters have a high likelihood of recognition.

17. (Original) The machine readable storage of claim 12, further comprising the step of pre-specifying a likelihood of recognition value for each of said characters.

18. (Original) The machine readable storage of claim 12, further comprising the step of, if said matching step produces a set of matching data, each data item in said set matching said sub-string input, disambiguating a desired data item from other data items in said set.

19. (Original) The machine readable storage of claim 18, wherein said disambiguating step comprises the steps of:

selecting an additional field for processing,

additionally prompting said interacting user for additional input for said additional field;

matching received additional input for said additional prompting with data which conforms to said acceptable input to locate the string input for the field.

IX. EVIDENCE APPENDIX

No evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 of this title or of any other evidence entered by the Examiner has been relied upon by Appellant in this Appeal, and thus no evidence is attached hereto.

X. RELATED PROCEEDINGS APPENDIX

Since Appellant is unaware of any related appeals and interferences, no decision rendered by a court or the Board is attached hereto.